Is surprise a clue?

The collaborative construction of insights about technology-in-use from semi-experimental testing settings

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Is surprise a clue?

The collaborative construction of insights about technology-in-use from semi-experimental testing settings

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Innovation involves developing (technological) prototypes that can be tested, evaluated, further developed, tested again, etc.

- What are peoples methods for accomplishing this?
- How are insights established in this process?

Suggestion: Displaying surprise *could* mark an insight

- **"Learning":** through embodied practices, e.g. professional vision (Goodwin)
- **Psychologists about surprise**: a basic emotion with a specific expression, e.g. raising of the upper eyelids (Ekman, 2005).
- **Interactional. Cognition on the ground** (Maynard, 2006).
  - Non-lexicalized sounds. Goffman (1978) described these as '**response cries**'.
  - **"Surprise tokens"** (Wilkinson & Kitzinger, 2006): the unexpectedness of information conveyed in a prior turn
  - The particle 'oh', as a locally accomplishment of a **change-of-state** of knowledge produced in response to an informing. (Heritage, 1984).
  - **Epistemic status and stance**: Going from K- → K+
    - Typically in a context of verbal informing (news delivery) and verbal responding.
    - Typically as an asymmetry between person A-B – focusing on individual actors.
  - My working definition of **surprise in semi-experimental test settings**:
    - A multimodal response to an unexpected "information" (being an action), that (may) display an insight (a change in epistemics).
    - Co-constructed through joint involvement with no (clear) prior asymmetry in knowledge
    - Directed towards a third: technology-in-use

Between the Lab and the Wild: Semi-experimental settings (ecological experiments) for producing insights about technology-in-use. Ecology of test-persons, technology and participants

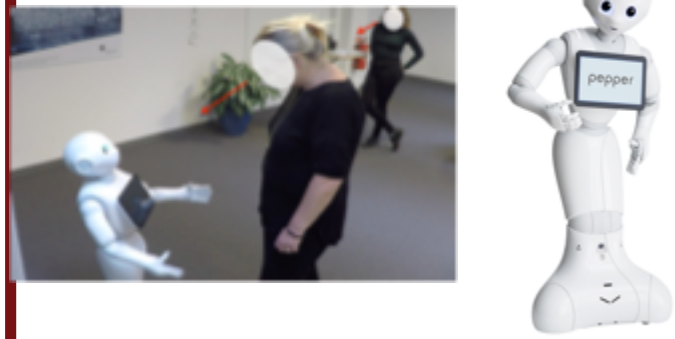
1: Engaging with a new product

Participant getting acquainted with new tech.

2: Engaging with a prototype

Participant testing functionalities

3: Engaging with a robot

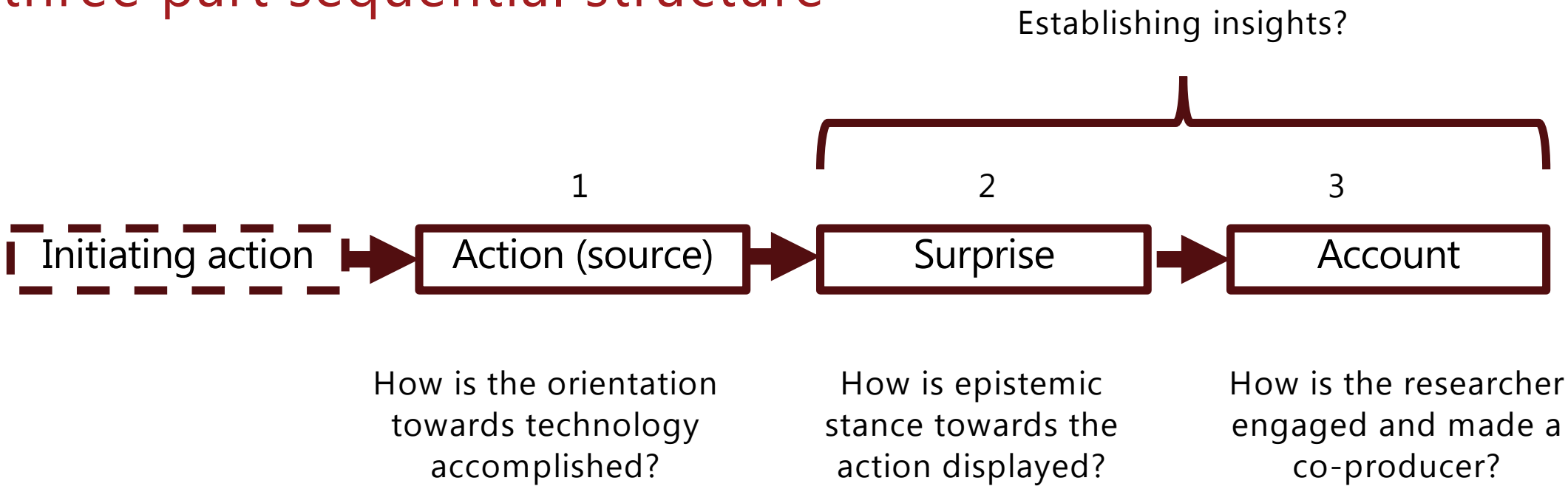


Participant experiencing human-robot possibilities

- '**naturally organized ordinary activities**' (Garfinkel, 1991): An ordering of activity that is spontaneous, local, autochthonous, temporal, embodied, endogenously produced and performed as a matter of course.

Lynch, M. (2002). From naturally occurring data to naturally organized ordinary activities: comment on Speer. *Discourse Studies*, *4*(4), 531–537.

A three part sequential structure



IRE = Initiating, Responding, Evaluation in educational contexts
Mehan, H. (1979). "What Time Is It, Denise?": Asking Known Information Questions in Classroom Discourse. *Theory into Practice*, *18*(4), 285–294.
Repairs in third positions (not turns).
Schegloff, E. A. (1992). Repair After Next Turn: The Last Structurally Provided Defense of Intersubjectivity in Conversation. *American Journal of Sociology*, *97*(5), 1295.
In argueing: a) taking a proposition, b) give a concession and c) re-submit in a new version (reassertion).
Antaki, C., & Wetherell, M. (2000). Show concessions. *Communication Abstracts*, *23*(1), 3–149.
Lindström, J. K., & Londen, A.-M. (2013). Concession and reassertion: on a dialogic discourse pattern in conversation: *Test & Talk*, *Vol 33*(3), 331–352.
In proposing e.g. new ideas: a) proposal, b) critique, c) management
Due, B. L. (2015). Idéudviklingens trepartstruktur og den katalytiske funktion af kritik. *Språk och interaktion*, *4*(2).


RES1: and then try to move them a little around (.) try to see if
if (.) if you can capture something by moving the glasses themselves (.) yes

1) Action (source): instructing in tech-use

Multimodal resources for producing instructions:
- Body posture
- Hand gestures
- Linguistic descriptions

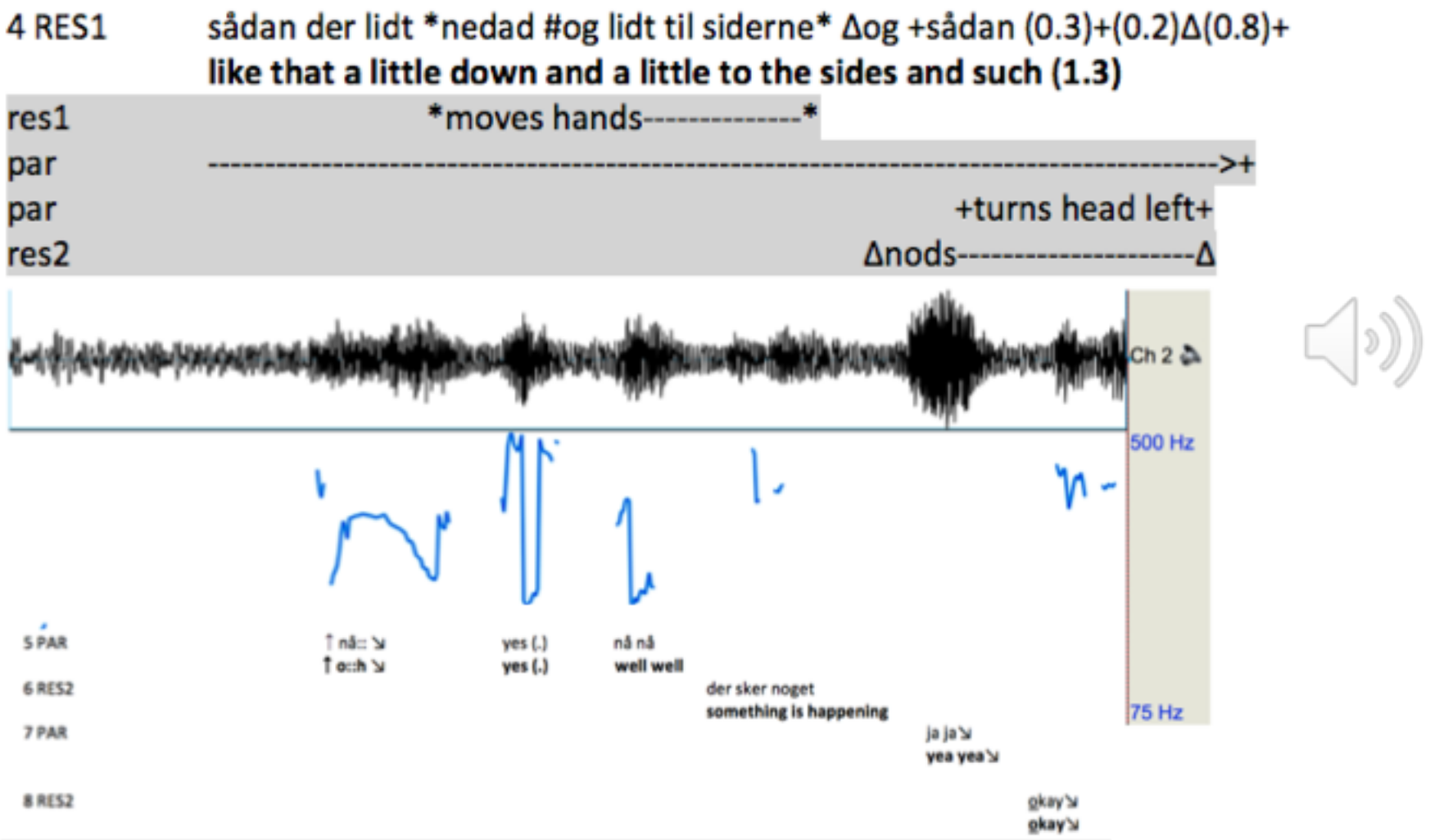
1 PAR	#jaer
	yea
res1	>>bends down---->
2 RES1	**og så *prøv at kør den* sådan lidt *+rundt (.) #altså prøv at se *om+
	and then try to move them a little around (.) try to see if
res1	*,,,*
res1	*.........*hand gesture------------------*
res1	*..........--->
par	+turns head left------------------+
3 RES1	*+om (.) #om du kan *fange noget ved at *flyt (.)* på+++selve brillen+ lidt (.) ja
	if (.) if you can capture something by moving the glasses themselves (.) yes
res1	*hand gesture--------*
res1	*moves hands*
par	+turns head right ---+
par	+turns head left+
par	+moves glasses around--->

After instruction; he keeps head still and moves glasses instead

2) Surprise and 3) evaluation. Displayed by pitch

Expressing surprise (change-of-state) through pitch (and "oh")

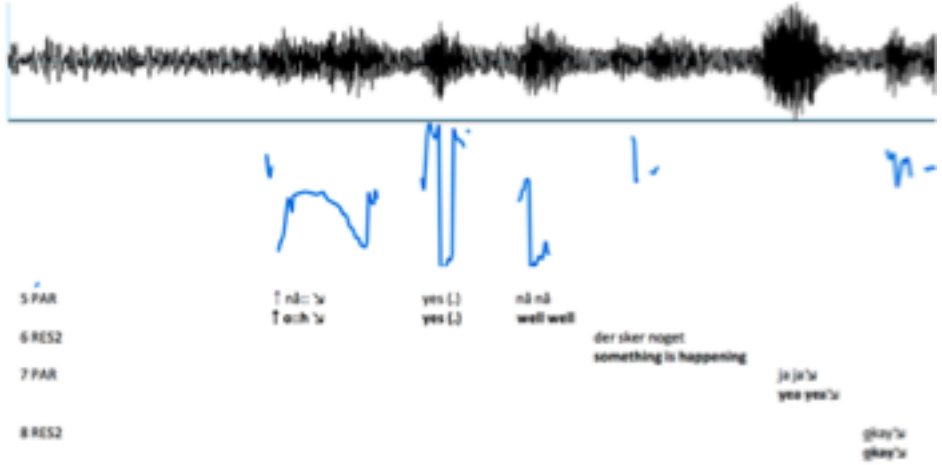
Minimal account by formulation (l. 6) and affiliation by high pitch (l. 8)

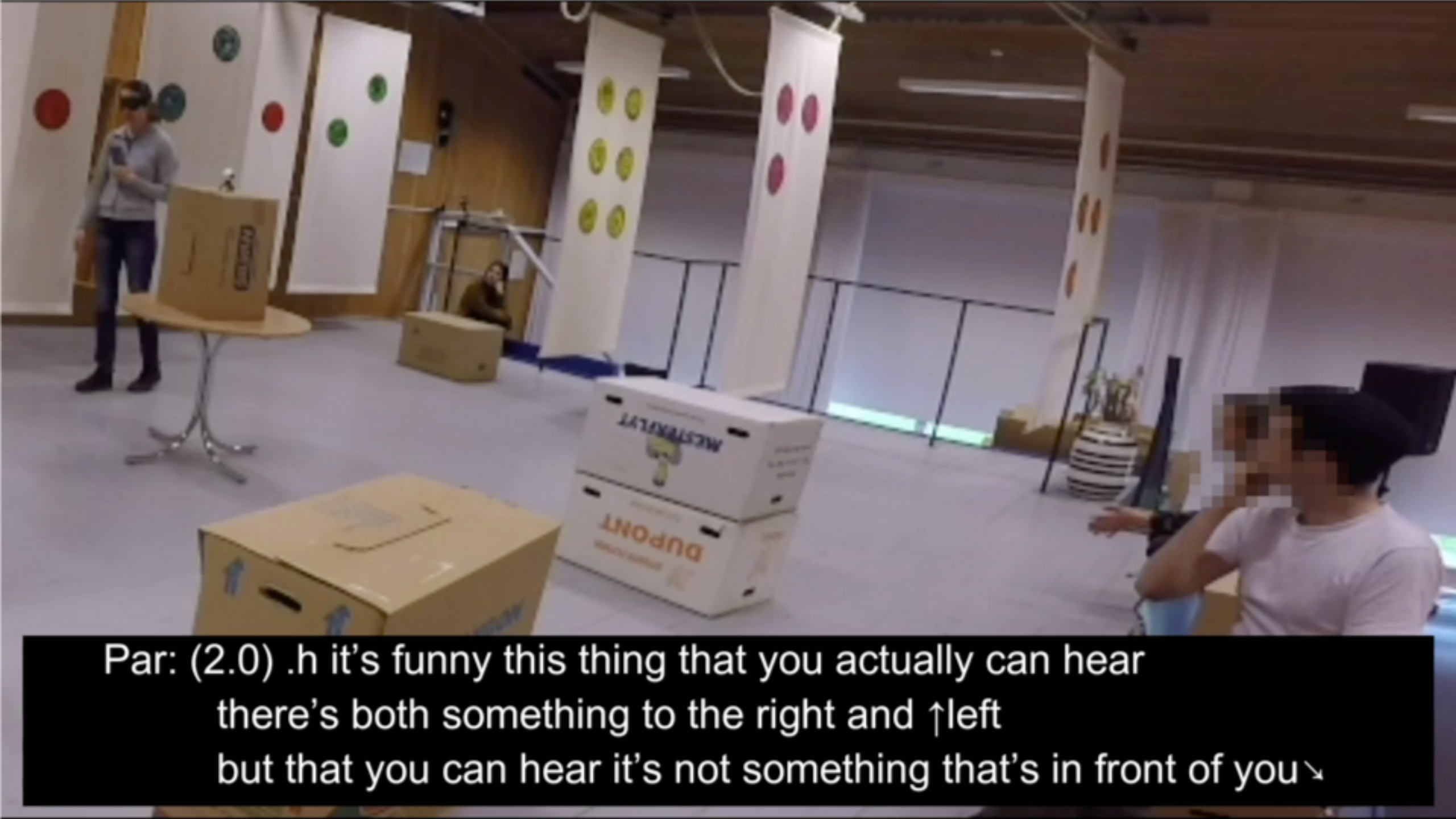


Possible insight elevated to a general finding for innovative purposes

When using the device, the user should not turn the head or make rough movements, but gently adjust only the position of the glasses

Recognizable as a surprisingly insight from the production of pitch, the use of “oh” and minimal account (okay, nodding).





Par: (2.0) .h it’s funny this thing that you actually can hear
there’s both something to the right and ↑left
but that you can hear it’s not something that’s in front of you↘

1) Action (source): Reporting on the experience (news delivery)

1 PAR (2.0) .h det meget sjovt +det her med+ +at man +faktisk+ godt kan høre+
(2.0) .h it's funny this thing that you actually can hear
par +left foot back+
par +right foot back+
par +moves r hand from side to side+

2 PAR +der er #både noget til højre og #*ven ↑ stre
there's both something to the right and ↑ left
par +extents r arm to the left---------->
res1 *nods---------->
fig #fig1,2 #fig3,4

Describing experience with tech.

3 RES1 (0.2) mm
(0.2) **mm**
par ---------->
res1 ---------->

Minimal response

4 RES2 Δja (0.5)* (0.2)Δ+
yes (0.7)
res1 --------->*
res2 Δcrosses armsΔ
par ---------->+

Extended turn; designed to deliver a point

5 PAR +men at man godt kan høre #+det ikke er noget der er foran en↘
but that you can hear it's not something that's in front of you↘
par +.....+extents r arm in front of her---------->
fig #fig5,6

fig5

fig6

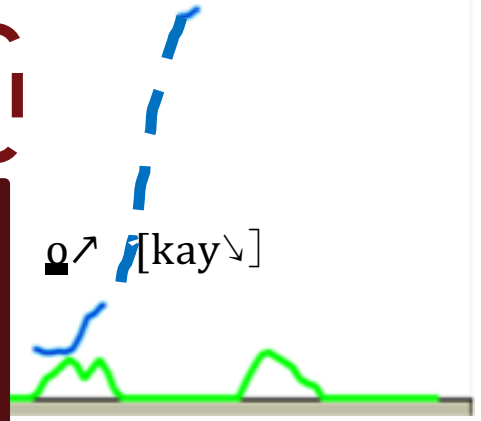
2) Surprise and 3) account.

Question designed
request for confirmation

6 RES1 ka du godt det↗
can you hear that↗
par ---------->

7 PAR ja
yes
par ---------->

8 RES2 ((raises eyebrows)) o↗ [kay↘]
((raises eyebrows)) o↗ [kay↘]



9 RES1 Δ*[okay]*
[okay]
res1 *nods--*
res2 Δlooks at res1-->>
par ---------->>

Displaying surprise through facial expression and pitch

Minimal account through confirmation, nodding and involvement

Possible insight elevated to a general finding for innovative purposes

Using the device: It is possible to distinguish whether information comes from the sides or in front of the user.

Recognizable as an surprisingly insight from the multimodal production of facial expression, pitch, the use of "okay" and embodied orientation to co-participant for (minimal) joint involvement.

Insights from interactions with a robot (Pepper)

- Insights about sequential well-fitted robot-actions
- Insights about sequential un-fitted robot-actions

1) Action (source) 2) surprise and 3) account (evaluation)

1) Question design.
Positioned in F-formation

1 PAR	**+do you +↑eat+**
par	+.....+raises head+
2 PEP	**(0.8) ((beeping sound)) Δi like to #haveΔΔmy electro streamΔ**
pep	Δraises arms----Δ
pep	Δgathers hands-------Δ
fig	#fig1,2

fig1

fig2

Robot "gaze" at human

3 PEP	**Δ↑shaken (.)ΔΔnotΔ stirredΔΔ**
pep	Δ.....Δlooks downΔ,,,,Δ
pep	Δlowers arms to a 135 degree angelΔ
4 PAR	**#+hahaha+**
par	+leans head back+
fig	#fig3,4

2) Surprise through embodied laughter

5 PAR	**Δ+ha [haΔ #😊it's a good answer😊++haha]**
6 RES	**[hahahaha]**
pep	Δlowers armsΔ
par	+looks at res----------+
par	+looks at pep--->>
fig	#fig5,6

3) Co-constructed evaluation

1) Action (source) 2) surprise and 3) account

1 PAR1 *Δno [( )]
2 PEP +Δ[knuckles]*# (0.8)ΔΔ (0.5)+(0.7)+(0.6)+
pep Δextents r arm----------Δ
pep Δforms fist----------Δ
par1 +gives pep knuckles----------+
par1 +stands up+
res *stands back-----*
fig #fig1,2

fig1

fig2

1. Robot-human action (knuckles) (physical contact)

(bodily adjusting to the robot in space)

3 PEP ΔΔmonty +#monty+ +monty+ *maΔΔ
pep Δraises r arm----------Δ
pep Δopens and closes r hand----------Δ
par1 +looks at par2+
par1 +looks at pep+
res *walks back----->
fig #fig3,4

4 PAR1 +%Δ[ha+#ha+ ++☺oka*%:::+:::y☺]Δ

5 PAR2 [hahahahahahaha]

2. Laughs (full body)

6 RES [hahaha]
pep Δlowers arms----------Δ
par2 %leans head back--------%
res ---------->*
par1 +leans back--+
par1 +looks at par2---------->>
par1 +moves r arm back+
par1 +walks away---------->>
fig #fig5,6

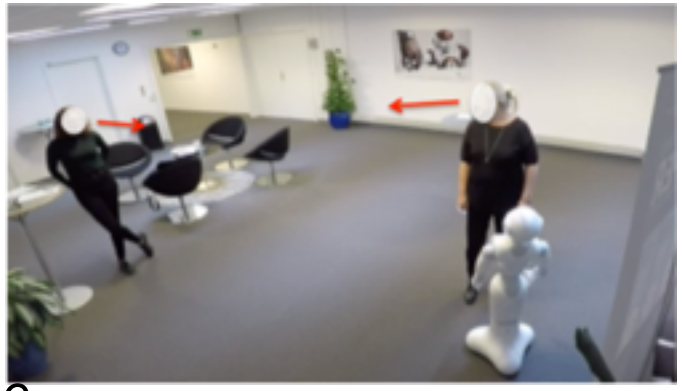
3. Orient to co-participants

Possible insight elevated to a general finding for innovative purposes about sequential well-fitted robot-actions

The robot's production of (self-ironical) jokes in social interaction with humans works well.

The robots "head/gaze" orientation towards the human is mirrored by the human and establish an F-formation.

Humans adjust to the robot's production of human-like "bodily" actions and engages without problems in tactile interactions with the robot



Recognizable as an surprisingly insight from the multimodal production of laughter (sound/facial expression/whole body movement) and made accountable through orientation to the co-participant and the establishment of joint attention / common ground.

1) Action 2) surprise and 3) account

1. Question design and (unfitted) response

(bodily orientation with tilted head. F-formation)

2. Surprise through whole body laughs

3. Involving co-participants. Producing verbal account

1 PAR1 **can you remind me in ten minutesΔ that i have to (.) go↗**
pep >>lowers arms----------Δ

2 PEP **((beeping)) bye Δ↑bye #((beeping))Δ**
pep Δraises arms----------Δ_____.--->
fig #fig1,2

fig1

fig2

3 PAR1 **+hh%[hhh.#+%ha#haha]**
4 RES **[hahahaha]**
5 PAR3 **[hahahaha]**
6 PAR2 **[hahahaha]**
par1 +leans back---------->
par1 +looks to the left--->
par2 %looks to the right%
pep .....---->
fig #fig3,4 #fig5,6

fig3,4

fig5,6

7 PAR2 **+++haha+ha+hahaΔ**
par1 ->+
par1 ->+
par1 +.....+slaps legs+
pep .....Δ
8 PAR1 **well i guess you ↓can't +%((RES coughs))+**
par2 %looks to the right----->>
par1 +puts hands in pockets+

1) Action 2) surprise and 3) account

1 PAR can i +hold your #hand↗+
par +extents left arm--+
fig #fig1,2

fig1 fig2

2 PEP ((beeping)) (2.6)

3 PAR hey [can i] hold your hand↗=

4 PEP [((beeping))]

5 PEP [=↑hi ((beeping))]

1. Question design and reformulation (l. 3)

2. Surprise through strong gestural action

3. Verbal account directed to co-participant (researcher)

6 RES #Δ+[((clears throat))]Δ Δha+ha #h. h. h. +h. h. .h Δ(2.3)
pep Δmoves arms forwardΔ
pep Δwaves----------Δ.....-->
par +.....+pulls hand away+
fig #fig3,4 #fig5,6

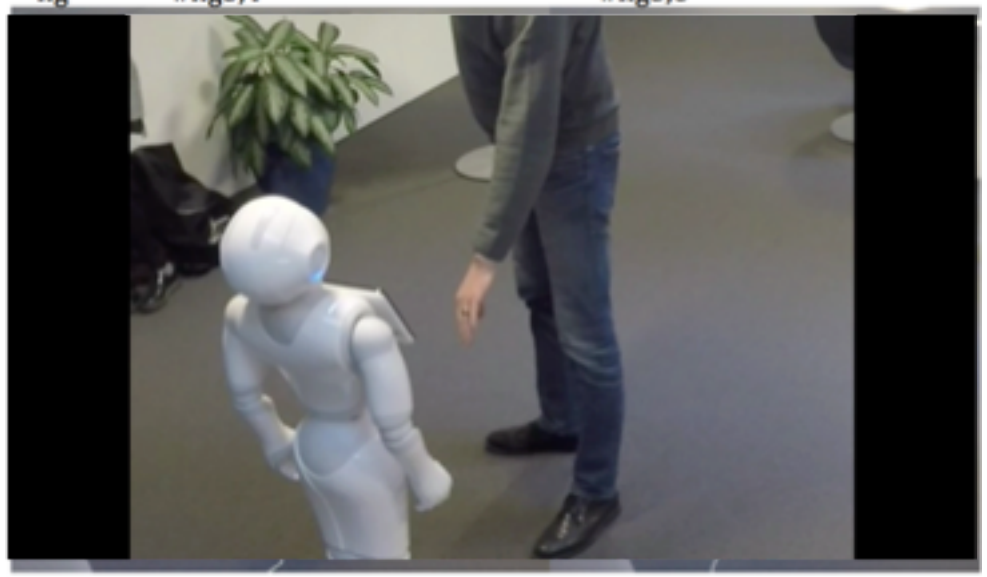


fig3,4 fig5,6

7 PAR +interessant↘+Δ+
interesting↘
par +hand gesture towards pep+
par +looks at res-->>
pep .....Δ

Possible insight elevated to a general finding for innovative purposes about sequential un-fitted robot-actions

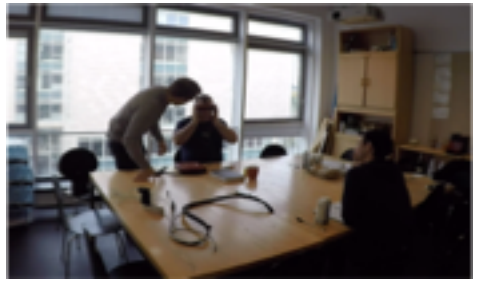
The robot's production of actions, that are inappropriately fitted to the sequential context, are treated as such. Unexpected "physical" robot actions are misplaced.

Recognizable as surprisingly insights from the multimodal production of laughter (sound/facial expression/whole body movement) or gesturing actions. Made accountable through orientation to co-participant.

Displayed surprise *may* be ***a clue*** for the establishment of insights

Surprise: A multimodal response to an 'unexpected' tech-oriented action.

Insights: Collaboratively co-constructed change in epistemic status. An ecological epistemic community: An interactional achievement: Involving co—participants; producing joint attention / common ground.



Multimodal resources for displaying surprise (epistemic stance):

- Sequentially fitted as a second part response to a source action → projecting accounts in a third position.
- In a context of "Between the Lab and the Wild": MAN+MACHINE = inter-corporeal-machine-ity
- Use of prosodic resources and production of high pitch
- Lexicalized tokens: oh, okay,
- Non-lexicalized sounds: (joint) laughter
- Whole body reactions: rapid gesturing (withdrawing); embodied laughs (backwards leaning)
- Facial expressions; raised eyebrows

Thank you